

AMENDMENTS TO THE SPECIFICATION

1. Please replace the TITLE on page 1, beginning on the line numbered 1 and ending on the line numbered 2, with the following amended TITLE:

HAND TOOL

2. Please replace the BACKGROUND OF THE INVENTION on page 1 through page 3, beginning on the line numbered 5 in page 1 and ending on the line numbered 22 in page 3, with the following paragraph:

The present invention is related to an improved a hand tool, and more particularly to a hand tool that having includes a double lever structure which can be more for a conveniently and safely used a convenient and safe operation.

With reference to Fig. 9 11 and Fig. 10 12 that show a conventional double lever hand tool composed of two symmetrical handles 81, 82 and a tool head 9. The two handles 81, 82 are pivotally connected to each other via a shaft 83. The tool head 9 is composed of two a first jaws 91,

and a second jaw 92 pivotally connected with each other. The bottom end of each of the two jaws 91, 92 is formed with a pivot hole 911, 921 having and an opening 912, 922 respectively communicating with the pivot hole 911, 921. The two handles 81, 82 each has a flattened pin 811, 821 laterally extending therefrom and respectively pivotally received in a corresponding one of the two pivot holes 911, 921 in the two jaws 91, 92. Two flattened pin 811, 821 are respectively fixedly disposed on the two handles 81, 82. When the two handles 81, 82 are pivoted and opened to a predetermined position, the The two flattened pins 811, 821 can be moved out of the two pivot holes 911, 921 through the opening 912, 922 as shown in Fig. 10 when the two flattened pins 811, 821 are rotated relative to the two jaws 91, 92 to linearly corresponding to the two openings 912, 922. Accordingly, the tool head 9 can be detached from the two handles 81, 82 and replaced by another one with different pattern.

A torque spring 84 is fitted on sleeved around the shaft 83. Two and having two ends 841, 842 of the torque spring 84 respectively extending to abut again the flattened pins 811, 821 bottom end of each of the two jaws 91, 92. By means of the resilient force of the torque spring 84, the two handles 81, 82 are pushed away from each other relative to each other due to the restitution force of the torque spring 84. The jaws 91, 92

of the tool head 9 are respectively formed with stop faces 913, 914, 923, 924 adjacent to the pivot sections, when the torque spring 84 pushes open the two handles 81, 82, the stop faces 913, 914, 923, 924 of the jaws 91, 92 abut against each other to restrict the open angle of the handles 81, 82 to a maximum angle. The first jaw 91 includes first stop face 913 formed on a first side thereof and a second stop face 914 formed on a second side thereof, and the second jaw 92 includes a first face 923 formed on a first side thereof facing the second stop face 914 of the first jaw 91 and a second stop face 924 formed on a second side thereof facing the first stop face 913 of the first jaw 91. The first stop faces 913, 923 respectively selective abut against the second stop face 924 of the second jaw 92 and the second stop face 914 of the first jaw 91 to restrict the open angle of the handles 81, 82 to a maximum angle when the torque spring 84 pushes open the two jaws 91, 92.

A switch block 85 is pivotally disposed on one of the two handles 81, 82, while the other in the preferred embodiment of the prior art, the switch block is pivotally disposed on the handle 82 and the handle 81 is formed with a stop face 812 corresponding to the switch block 85. When the two handles 81, 82 are closed, the switch block 85 can be rotated to abut against the stop face 812 for stopping the handles 81, 82 from

rotating.

The above double-lever tool has a shortcoming as follows:

The stop faces 913, 914, of the jaw 91 and the stop faces 923, 924 of the jaws 91, 92 respectively abut against each other to restrict the open angle of the handles 81, 82 to a maximum angle. However, the stop faces 913, 914, 923, 924 of the jaws 91, 92 are formed on outer sides of the jaws 91, 92. Therefore, when the torque spring 84 pushes open the handles 81, 82 and the stop faces 913, 914, 923, 924 of the jaws 91, 92 get close to each other, ~~a~~ so that the user's finger is easy to be pinched and injured due to the closing stop faces 913, 914, 923, 924 of the jaws 91, 92.

Moreover, as shown in Fig. 11, the switch block 85 lacks any locating structure so that, in use, the switch block 85 will freely rotate to stop the lateral side of the handle 81. As a result, a user will be unable to fully hold the handles 81, 82 together. Accordingly, the jaws 91, 92 of the tool head 9 will be unable to tightly clamp a work piece.

~~When clamping a larger work piece, the~~ The two handles 81, 82 must be opened to the maximum angle, as shown in Fig. 12, when clamping a large work piece. However, the handles 81, 82 are symmetrically outward arched. Therefore, when the user's thumb pulls the handle 81, the user's

index finger, ring finger and little finger can hardly full the other handle 82 and only the middle finger can constrainedly pull the handle 82. Accordingly, it is hard for the user to force and hold the handles 81, 82 together.

When replacing the tool head 9, the user needs to stretch the handles 81, 82 to a large width as shown in Fig. 10 12, whereby the flattened pins 811, 821 can be moved out of the pivot holes 911, 921 through the openings 912, 922. Under such circumstance, the two ends 841, 842 of the torque spring 84 outward protrude from the handles 81, 82 and tend to impale a user. Furthermore, the handles 81, 82 cannot be truly located at an open angle. Therefore, the user needs to on one hand stretch the handles 81, 82 and on the other hand try to outward pull the tool head 9. Only when the flattened pins 811, 821 are aimed at the openings, the tool head 9 can be detached from the handles. Such operation is quite inconvenient to the user.

3. Please replace the SUMMARY OF THE INVENTION on page 3 through page 5, beginning on the line numbered 24 on page 3 and ending on the line numbered 10 on page 5, with the following

amended SUMMARY OF THE INVENTION:

It is therefore a primary object of the present invention to provide an improved hand tool in which one of the two pivotally connected handles has a projecting block, while the other one of the two handles is formed with a slot cooperating with the projecting. By means of the cooperation between the slot and the projecting block, the pivoting angle of the handles is restricted to protect a user's fingers from being pinched and injured.

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It is a further object of the ~~present invention to provide the above an~~ improved hand tool in which one handle is pivotally provided with a switch block and has a protuberance ~~for laterally extending to stopping~~ stop the switch block. ~~Therefore, to prevent~~ the switch block ~~is prevented~~ from interfering with the holding and closing of the handles.

It is still a further object of the ~~present invention to provide the above~~ improved hand tool in which one of the two handles has a second grip section having a large arched recess greater than that of the other. A user's index finger and middle finger can more easily together pull the second grip section so that the hand tool of the present invention can be more conveniently used.

It is a further object of the ~~present invention to provide the above~~

improved hand tool in which ~~the each~~ handles ~~have has~~ stop boards respectively corresponding to the press sections of the torque spring. When the handles are widely opened, the press sections are stopped and restricted by the stop boards of each of the two handles to prevent the two press sections of the torque spring from protruding out of the handles.~

~~Accordingly, a user is to protect the user's fingers from being impaled.~~

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It is still a further object of ~~the present invention to provide~~ the above improved hand tool in which the one handle with the slot is formed with a dent corresponding to the projecting block of the other handle. When the handles are pivoted to a position where the narrowed sections of the pins can be detached and moved out of the pivot holes through the openings, the projecting block is engaged in the dent to locate the handles. Accordingly, the tool head can be more conveniently assembled or disassembled.

~~The present invention can be best understood through the following description and accompanying drawing wherein:~~ Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

4. Please replace the BRIEF DESCRIPTION OF THE DRAWINGS on page 5 through page 6, beginning on the line numbered 14 on page 5 and ending on the line numbered 12 on page 6, with the following amended SUMMARY OF THE INVENTION:

Fig. 1 is a perspective assembled view of the a hand tool in accordance with the present invention;

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Fig. 2 is a partially sectional assembled side plane view in partial cross-section of the present invention hand tool in Fig. 1;

Fig. 3 is an a partially enlarged view of a part of hand tool in Fig. 2;

Fig. 4 is a partial cross-sectional view for showing the structure of the pivoted sections of the two handles of the present invention of the hand tool in Fig. 1;

Fig. 5 is a partial side plane view of the structure of the present invention hand tool in Fig. 1;

Fig. 6 shows the use of the present invention is an operational view of the hand tool in Fig. 1;

Fig. 7 shows that is a bottom plane view in partial cross-section when the handles of the present invention are stretched open and the side boards are resiliently deformed;

Fig. 8 shows that is a partial side plan of the handles of the present invention when the handles are fully stretched open for assembling or disassembling the tool head;

Fig. 9 shows the structure of is a side plan view of a second embodiment of a hand tool in accordance with the present invention when the two handles are fully stretched open;

Fig. 10 shows the structure is a side plan view of a third embodiment of a hand tool in accordance with the present invention;

Fig. 11 is a side plan view of a conventional double lever tool in accordance with the prior art;

Fig. 12 is a partial enlarged view of the conventional double lever tool in Fig. 11 showing the structure of the conventional double lever tool when the handles of the conventional double lever tool are fully stretched open;

Fig. 13 is a side plan view of the conventional double lever tool, in Fig. 11 showing that in which the switch block interferes with the closing of the handles; and

Fig. 14 is an operational view showing the use of the conventional double lever tool in Fig. 11.

5. Please replace the DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT on page 6 through page 14, beginning on the line numbered 17 on page 6 and ending on the line numbered 12 on page 14, with the following amended DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT:

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Please refer to Figs. 1 to 5. The A hand tool of in accordance with the present invention includes two handles 1, 2 a first handle 1 and a second handle 2 each having a top pivotally connected to each other and a tool head 3 pivotally connected with each other to the first handle 1 and the second handle 2 near the top of each of the first handle 1 and the second handle 2.

The tool head 3 is composed of two jaws 31, 32. The a first jaw 31 and a second jaw 32 each having a middle portions of the jaws 31, 32 are pivotally connected to each other on by a pivot shaft 30. One end of each jaw 31, 32 has a clamping section 311, 321. A first clamping section 311 is formed on a first end of the first jaw 31 opposite to the first handle 1 and a second clamping section 321 is formed on a first end of the second jaw 32 opposite to the second handle 2. The opposite end of each jaw 31, 32 has a connecting section 312, 322 formed with a pivot hole 313, 323

~~for pivotally connecting with the handles 1, 2. Each pivot hole 313, 323 has an opening 314, 324. The first jaw 31 has a first connecting section 312 formed on a second thereof and pivotally received in the first handle 1 near the top of the first handle 1. A first pivot hole 313 is defined in the first connecting section 312 and laterally extending through the first jaw 31, and a first opening ³¹⁴ is defined in the second end of the first jaw 31 and upwardly communicating with the first pivot hole 313. The second jaw 32 has a second connecting section 322 formed on a second thereof and pivotally received in the second handle 2 near the top of the second handle 2. A second pivot hole 323 is defined in the second connecting section 322 and laterally extending through the second jaw 32, and a second opening ³²⁴ is defined in the second end of the second jaw 32 and upwardly communicating with the second pivot hole 323.~~

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~~Each handle 1, 2 has a pivoted end 101, 201. The first handle 1 includes a first pivot end 101 formed on the top thereof and the second handle 2 includes a second pivot end 201 formed on the top of the second handle 2. The first pivot end 101 and the second pivoted ends 101, 201 are pivotally connected with each other on by a shaft 10 extending therethrough. A section of each handle 1, 2 near the pivoted end 101, 201 is formed with a caved section 11, 21 laterally passing through the handle~~

1, 2. The first handle 1 and the second handle 2 respectively includes a first caved section 11 and a second caved section 21 formed thereon
respectively near the first and second pivot end 101, 102. The first and
second caved sections 11, 21 respectively laterally extending through the
first handle 1 and the second handle 2. The handles 1, 2 is divided by the
caved section 11, 21 into two side boards 102, 103, 202, 203. The first
caved section 11 divides the top of the first handle 1 into a first side board
102 and a second side board 103, and the second caved section 21 divides
the top of the second handle 2 into a third side board 202 and a fourth
side board 203 respectively corresponding to the first side board 102 and
the second side board 103. A pin 12, 22 is disposed between the side
boards 102, 103, 202, 203 of each handles 1, 2. A first pin 12 is disposed
between the first side board 102 and the second side board 103, and has
one end secured on the first side board 102. A second pin 22 is disposed
between the third side board 202 and the fourth side board 203, and has
one end secured on the fourth side board 203. One end of the pin 12 and
one end of the pin 22 are respectively fixed on the side boards 102, 203.
Each of the first and second pins 12, 22 has a non-circular cross-section
with a narrowed section 121, 221. The first and second openings 314, 324
of the first and second jaws 31, 32 are each has a width slightly larger

than that of two the narrowed sections 121, 221, whereby the first and second pins 12, 22 can respectively pass through the first and second openings 314, 324 into the first and second pivot holes 313, 323 of the first and second jaws 31, 32. The pivotally connected handles 1, 2 and the pivotally connected jaws 31, 32 of the tool head together form a double lever structure. When the first and second handles 1, 2 are relatively pivoted to each other, the first and second jaws 31, 32 are driven and pivoted relative to each other. At this time, the first and second clamping sections 311, 321 can clamp a work piece.

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Referring to Figs. 2 and 6, the first and second handles 1, 2 have asymmetrical patterns. The outer side of a section of the first handle 1 near the shaft 10 is formed with a first grip section 13 having a small arched recess (not numbered). A user's thumb can pull the first grip section 13. The outer side of a section of the other second handle 2 near the shaft 10 is formed with a second grip section 23 bent toward the first grip section 13 and having larger a arched recess (not numbered) greater than that of the first grip section 13. A user's index finger and middle finger can pull the second grip section 23 toward the first grip section 13. Two sheaths 14, 24 are respectively fitted on the first and the second handles 1, 2. The sheaths 14, 24 each have has a profiles respectively.

corresponding to the profiles of the first and second handles 1, 2.

The side boards 103, 202 respectively have two projecting blocks 151, 251. With reference to Fig. 4, the second side board 103 has a first projecting block 151 laterally extending therefrom and movably received in the fourth side board 203, and the third side board 202 has second projecting block 251 laterally extending therefrom and movably received in the first side board 102. The other side board 102, 203 are respectively formed with two slots 152, 252 cooperating with the projecting blocks 151, 251. As shown in Fig. 4, the slots 152, 252 are positioned in the moving paths of the projecting block 151, 251 when the handles 1, 2 are relatively pivoted. The first side board 102 has a first slot 152 laterally defined therein for movably receiving the second projecting block 251 and the fourth side board 203 has second slot 252 laterally defined therein for movably receiving the first projecting block 151 when the first handle 1 and the second handle 2 are pivotally connected to each other.

By means of cooperation between the first and second slots 152, 252 and the first and second projecting blocks 151, 251, the pivoting range of the first and second handles 1, 2 is restricted. The handles 1, 2 are respectively formed with two dents 19, 29 corresponding to the projecting blocks 151, 251. The first side board 102 has a first dent 19 defined in a

periphery thereof and corresponding to the second projecting block 251,
and the fourth side board 203 has a second dent 29 defined in a periphery
thereof and corresponding to the first projecting block 151. When the
~~handles 1, 2 are pivoted to a positioned where the narrowed section 121,~~
~~221 of the pins 12, 22 can be detached and moved out of the pivot holes~~
~~313, 323 through the openings 314, 324, the The first and second~~
projecting blocks 151, 251 are respectively engaged in the second and
first dents 19, 29, 19 to locate the second and first handles 1, 2, 1. When
when the first and second handles 1, 2 are pivoted to a positioned where
the narrowed section 121, 221 of each of the first and second pins 12, 22
can be respectively detached and moved out of the first and second pivot
holes 313, 323 through the first and second openings 314, 324.

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A switch block 26 is coaxially disposed on the second handle 2 about
the pin 22. The second handle 2 has a protuberance 27 formed on the
third side board 202 and abutting one side of the switch block 26 distal
from the handle 1. The so that the switch block 26 can be pivoted to lean
against the protuberance 27. The other first handle 1 is formed with a stop
face 16 on the periphery of the first side board 102 and corresponding to
the switch block 26. One side of the switch block 26 adjacent to the
protuberance 27 is defined with a first leaning 261 and a second leaning

face 262 in accordance with the pivoting direction of the switch block 26.

When the first and second handles 1, 2 are closed, with the second leaning face 262 of the switch block 26 leant against the protuberance 27, the switch block 26 abuts against the stop face 16 to prevent the first and second handles 1, 2 from rotating as shown in Fig. 5. When the switch block 26 is pivoted to lean the first leaning face 261 against the protuberance 27, the switch block 26 ~~will not contact with~~ is disengaged to the stop face 16 as shown in Fig. 6.

A torque spring 17 is fitted on the shaft 10. ~~Two ends of the torque spring 17 extend from the opposite sides of the handles 1, 2~~ The torque spring 17 has two opposite ends extending therefrom and respectively pass by abutting against the first and second pins 12, 22 of the first and second handles 1, 2 and then outward extend to respectively form two press section 171, 172 respectively inserted into the recesses first and second caved section 11, 21. In addition, the opposite internal sides of each of the first and second the handles 1, 2 are integrally bent to respectively form two a first stop boards 18, 28 and a second stop board 28 for stopping and restricting the two press sections 171, 172 of the torque spring 17 within the first and second caved sections 11, 21 of the first and second handles 1, 2.

The handles 1, 2 are respectively formed with cooperative slots 152, 252 and projecting blocks 151, 251. The moving range of the first and second projecting blocks 151, 251 is restricted by the first and second slots 152, 252. Accordingly, when the handles 1, 2 are resiliently stretched open by due to the restitution force of the torque spring 17, the first and second slots 152, 252 respectively restrain the second and first projecting blocks 151, 251, 151 so as to restrict the maximum open angle of the first and second handles 1, 2 as shown in Fig. 6. Therefore, the user's finger is protected from being pinched and injured as in the conventional structure.

The handle 2 has a protuberance 27 on one side of the switch block 26 distal from the handle 1. When the first leaning face 261 of the switch block 26 is leant against the protuberance 27, the switch block 26 will not contact with is disengaged from the stop face 16 of the first handle 1. Therefore, the switch block 26 will does not unexpectedly rotate to interfere with the closing of the first and second handle 1, 2 and so that the first and second handles 1, 2 can be are freely pivotally rotated relative to each other.

Moreover, the first and second handles 1, 2 have each has a shape being asymmetrical patterns relative to each other. The second grip

section 23 of the second handle 2 is bent toward the first handle 1 and has an large arched recess greater than that of the first handle 1. Accordingly, the distance between the second grip section 23 and the first handle 1 is shortened, whereby a user's index finger and middle finger can more easily together pull the handle 2.

Furthermore, when disassembling the tool head 3 from the first handle 1 and the second handle 2, a user only needs to forcedly stretch open the first and second handles 1, 2. At this time, the first and second projecting blocks 151, 251 will press the peripheries of the second and first slots 152, 252, 152. The caved section 11, 21 divide the handles 1, 2 to form the second and third side boards 103, 202 which can be are laterally resiliently deformed toward each other when suffering a force as shown in Fig. 7. Therefore, the first and second projecting blocks 151, 251 can be are respectively detached and moved out of the second and first slots 152, 252, 152. When the first and second handles 1, 2 are widely pivoted to a position where the first and second projecting blocks 151, 251 are respectively aimed at the second and first dents 19, 29, 19, the second and third side boards 103, 202 will resiliently restore to make the projecting blocks 151, 251 respectively engaged in the second and first dents 19, 29, 19 so as to locate the handles 1, 2 at a certain open

angle. At this time, the narrowed sections 121, 221 of the first and second pins 12, 22 can be respectively detached and moved out of the first and second pivot holes 313, 323 through the first and second openings 314, 324 as shown in Fig. 8. Accordingly, the tool head 3 can be more conveniently assembled or disassembled.

When the first and second handles 1, 2 are widely stretched open, the press sections 171, 172 of the torque spring 17 are stopped and restricted by the first and second stop boards 18, 28 of the two handles 1, 2 within the first and second caved sections 11, 21 thereof without protruding out of the handles 1, 2. Accordingly, a the user is protected from being impaled.

When the first and second handles 1, 2 are held together, the torque spring 17 is inward pressed by the first and second pins 12, 22 to exert an outward push force onto the first and second handles 1, 2. When the first and second handles 1, 2 are widely opened, the two press sections 171, 172 of the torque spring 17 are outward stretched by the first and second stop boards 18, 28 to exert a restricting force onto the first and second handles 1, 2 for pressing the first and second handles 1, 2 toward each other. Therefore, the torque spring 17 serves to resiliently keep the handles 1, 2 opened at a certain angle.

According to the above arrangement, the present invention has the following advantages:

1. By means of cooperation between the first and second slots 152, 252 and the second and first projecting blocks 151, 251, 151 of the handles 1, 2, the pivoting angle of the handles 1, 2 is restricted and a user is protected from being pinched injured.
2. The handle 2 has a protuberance 27 laterally extending from the third side board 202 and located on one side of the switch block 26 for stopping the switch block 26. Therefore, to prevent the switch block 26 is prevented from interfering with the holding and closing of the first and second handles 1, 2.
3. The second handle 2 has a second grip section 26 23 having a large arched recess greater than that of the first handle 1. Accordingly, a the user's index finger and middle finger can more easily together pull the handle 2 and thus the hand tool of the present invention can be more conveniently used.
4. The second projecting block 251 of the handle 2 can be engaged in the first dent 19 of in the first handle 1 to locate the first and second handles 1, 2 at a certain open angle. Accordingly, the tool head 3 can be more conveniently assembled or disassembled.

5. The first and second handles 1, 2 respectively have the first and the second stop boards 18, 28 respectively corresponding to the press sections 171, 172 of the torque spring 17, whereby the press section 171, 172 of the torque spring 17 are restricted by the first and second stop boards 18, 28 from protruding out of the first and second handles 1, 2. Accordingly, a the user is protected from being impaled.

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Fig. 9 shows a second embodiment of the hand tool in accordance with the present invention, in which the first and second sheaths 14, 24 fitted on the first and second handles 1, 2 are hollow, whereby the press sections 171, 172 of the torque spring 17 can extend into the sheaths 14, 24. The inner faces 141, 241 of the sheaths 14, 24 serve as stop faces for restricting the press sections 171, 172 of the torque spring 17 from protruding out of the handles 1, 2. Therefore, the second embodiment is able to achieve the same function as the first embodiment with the stop boards 18, 28 of the first embodiment omitted.

Fig. 10 shows a third embodiment of the hand tool in accordance with the present invention, in which the pivot holes (not shown) of the jaws 61, 62 have no opening. That is, after the pins 42, 52 are being fitted in the pivot holes, the tool head 6 cannot be detached from the handles 4, 5. In such structure, the handle 4 is formed with a first slot 451 and a

second slot 452 at intervals. The first and second slots 451, 452 are respectively positioned in the moving path of the projecting block 55 of the handle 5, respectively when the handles 4, 5 are relatively pivoted by a smaller open angle and a large open angle. The first slot 451 and the second slot 452 divide the moving range of the first and second handle 4, 5 into two sections respectively corresponding to the first slot 451 and the second slot 452. The moving range of the first and second handle 4, 5 in the first section, corresponding to the first slot 451, has an angle smaller than that in the second section that corresponds to the second slot 452.

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When the projecting block 55 is positioned within the first slot 451, the open angle of the handles 4, 5 is restricted within a smaller range and the hand tool of the present invention is suitable for clamping a general work piece. When clamping a large work piece, the handles 4, 5 are forcedly opened. At this time, the projecting block 55 will press the periphery of the first slot 451 to make the side board 403 flexed and deformed and the projecting block 55 will get out of the first slot 451. When the handles 4, 5 are pivoted a position where the projecting block 55 is aimed at the second slot 452, the side board 403 will resiliently restores and gets into the second slot 452. Therefore, the projecting block 55 is restricted within the second slot 452 and the open angle of the

handles 4, 5 is restricted within a large range and the hand tool of the present invention can is more conveniently used to camp a large work piece.

~~The above embodiments are only used to illustrate the present invention, not intended to limit the scope thereof. Many modifications of the above embodiments can be made without departing from the spirit of the present invention. Although the invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the spirit and scope of the invention as hereinafter claimed.~~

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